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The Low-Cost Cryostat

The problem:

To develop an inexpensive method of fabricating cryostats. Extremely cold materials such as liquid hydrogen or nitrogen are frequently stored for several weeks in vacuum-jacketed containers (dewars) which are expensive. Where less storage time is required, cryostats (dewars without vacuum jackets) are used, but they cannot be purchased, and the cost of making them is high.

The solution:

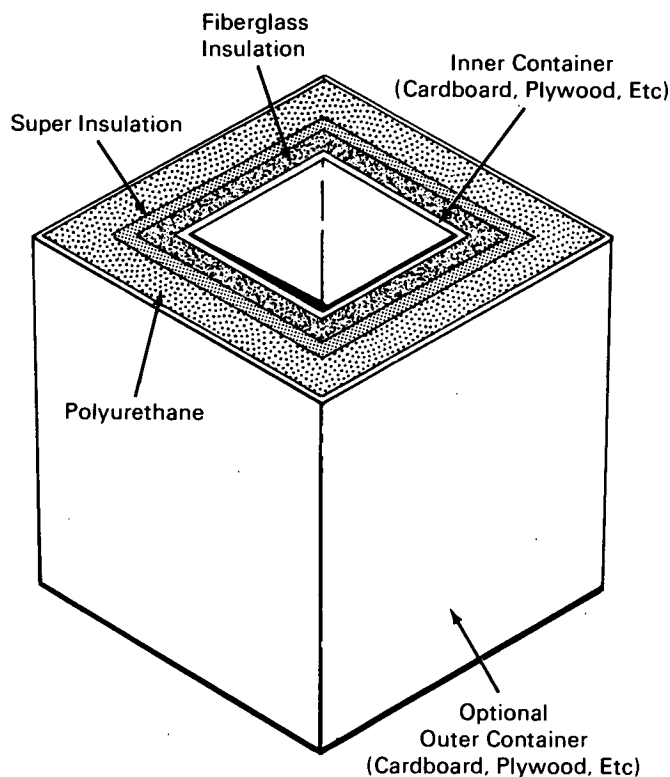
Fabrication of cryostats using commonly available materials.

How it's done:

An inexpensive method of fabricating cryostats has been developed utilizing the materials shown in the figure. Whereas a 50 liter dewar costs about \$150, an equal capacity cryostat can be constructed for about \$10, excluding labor. The more efficient dewar will hold liquid nitrogen for 3 weeks, while the cryostat provides 1 week storage which is usually enough time to conduct experiments of process materials. The cryostat will hold liquid hydrogen for 1 day.

In addition to the cost advantage, the cryostat weighs 1/10 of the dewar, and occupies about the same volume, is easy to handle, requires no metal parts, and can be formed into virtually any configuration. The materials can be purchased readily and assembled with little skill. The polyurethane layer can be poured in place (requiring an outer form), or jet-foamed. A satisfactory lid can be cut from sheet polyurethane.

A number of small and medium size cryostats have been in service for several years. One 300-gallon unit has also been fabricated. This technique should be of interest to a wide variety of cryogen users including



laboratories, schools, commercial processors, and food handlers.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B70-10592

(continued overleaf)

Patent status:

No patent action is contemplated by AEC or NASA.

Source: John C. Bronson of
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